REMARKS

This is in response to the Office Action dated August 13, 2003. Independent claims 1, 17 and 29 have been cancelled and replaced by claims 30, 37 and 38 respectively. Claims 2-9 and 18-25 remain pending. New claims 30-39 have been added to more particularly point out the differences in Applicant's invention.

The Examiner rejected previously pending claims 1,4 as being anticipated under 35 U.S.C. 102(b) by Wei (U.S. Patent No. 5,824,702) and alternatively under 35 U.S.C. 102(e) as being anticipated by deJuan, Jr. (U.S. Patent No. 6,399,655) and Lanzendorfer et al (U.S. Patent No. 6,423,747). The Examiner pointed out that the previously pending claims were directed to methods of treating the harmful effects of ionizing radiation throughout the entire body of a mammal exposed to radiation comprising, administering to said mammal a therapeutically effective amount of isoflavone. The Examiner argued that the only active step in the claim methods involved administration of isoflavone and stated that under the principles of inherency these claims were properly anticipated.

Applicant has amended all of the claims in this case to recite numerous steps not taught or anticipated by Wei, deJuan or Lanzendorfer, taken alone or in combination. All of these claims are directed to a method for radioprotection of a mammal or person, and involve the active steps of providing the person or mammal, an ionizing radiation source and an isoflavone, administering a therapeutically effective amount of the isoflavone to the mammal, exposing the entire body of the mammal to ionizing radiation produced by the radiation source, wherein the entire body of the mammal or person is protected from harmful effects of ionizing radiation by the administration of the isoflavone.

The Wei, deJuan and Lanzendorfer references do not anticipate the claims as amended and are directed to fundamentally different subject matter and applications than the present invention. To begin with, the present invention is directed to preventing the harmful or lethal effects of ionizing radiation throughout the entire body of a mammal. As such, the present invention relates to radioprotection, which has the effect of protecting the entire body from death or serious injury caused by the harmful effects of ionizing radiation.

In stark contrast, the Wei, deJuan and Lanzendorfer references are all concerned only with exposure to non-ionizing UV radiation. The Wei reference contains a typographical error, stating the UV rays are recognized as ionizing radiation (see Col. 1, line 54-60). This statement is simply wrong and not supported by scientific fact. All of these references therefore are concerned with exposure of a portion of the body to non-ionizing UV light and not ionizing radiation as is the present invention.

The second fundamental difference in the cited references is that their goal is chemoprevention not radioprotection, the goal of the present invention. Chemoprevention is an approach wherein certain drugs, or combinations of drugs are being used to prevent the occurrence of different localized diseases (e.g. diabetes, cataracts, cancers). In the three cited patents, the goal is to reduce the risk of skin damage, a local condition (Wei/Lanzendorfer) or reducing the risk of a local disease, such as cataract formation (deJuan, Jr.) as a result of exposure to non-ionizing UV light. These patents relate to the protection of light sensitive and normal skin or the eyes to UV rays from exposure to the sun. They are not directed to protection of the entire body of a mammal from serious damage, harmful effects or death caused by exposure to doses of ionizing radiation, let alone lethal doses of such radiation. The focus of the cited references is therefore to decrease or inhibit a localized condition and not the prevention of

harmful effects throughout the entire body of a mammal exposed thereto or increasing survival of a mammal exposed to, as is the present invention. Applicant submits that the claims as modified by this amendment now specifically contain several active steps setting forth the very important difference regarding radioprotection and ionizing radiation discussed above. As such, Applicant respectfully submits that they define patentable subject matter over these references, whether they are taken alone or in combination.

The Examiner also rejected previously pending claims 1-9, 17-25 and 29 under 35 U.S.C. 103(a) as being unpatentable over Brown (U.S. Patent No. 6,528,053) in view of Uckun et al (Proc. Natl. Acad. Sci. U.S.A., 89, 9005, 1992) in view of deJuan, Jr. Applicant respectfully submits that the claims as amended define patentable subject matter over these references, whether taken alone or in combination.

There are several key differences in the Brown patent when compared to Applicant's claimed invention. The Brown reference is limited only to the use of mixtures or combinations of flavonoids in a second different compound described as a synergist. Brown makes no reference to the efficacious use of a single flavonoid alone, in the protection of an organism from injury or death. Brown in fact teaches away from such use by requiring a synergist to be present with the isoflavonoid. The Brown reference also teaches only the effects of the isoflavonoid mixture on isolated cells or isolated organs that were simultaneously exposed to an experimental stress and the mixture. As such, Brown is primarily directed to abnormal or cancerous cells. The examples in the Brown patent were all directed to the effects of the isoflavonoid mixture on artificially grown (cultured) cells or isolated organs, not whole living organisms. Brown conducted his experiments with artificially grown (cultured) cells, utilizing an exclusively highly abnormal type of cell (GCL 1 cell line, see Example 1) obtained through fusion of rat liver

cancer cells with human cells. These cells are not relevant to normal non-cancerous cells comprising whole living organisms that are the subject of the present invention. As admitted in the Office Action, Brown likewise fails to discuss administration of the flavonoid mixture in a mammal.

Applicant further submits that the Uckun reference is not properly combinable to make up for any of the deficiencies in the Brown reference and, even if such combination is made, that it does not render obvious Applicant's invention as now claimed. The Uckun article pertains to abnormal malignant or "near malignant" cells and not to normal cells such as constitute normal tissues and organisms. Uckun discloses the use of genistein to protect cancer cells and cell lines ("transformed" or "near malignant" cells) from programmed cell death (apoptosis) subsequent to radiation exposure, but provides no evidence regarding the interaction of normal cells with radiation or genistein. Uckun's experiments do not use normal cells, but instead use cell lines developed either from cancer cells or from normal cells that have been drastically changed ("transformed" or "immortalized") by various methods to the extent that they exhibit characteristics and behavior of cancer cells, such as uncontrolled proliferation, unlimited potential for self replication and extended life span. The Brown reference discussed above recognized this very difference in column 23, lines 41-48 thereof, where it is stated "thus, [cell lines] are not accurate-model systems for cellular activities in most organisms, such as mammals". The Uckun article therefore is not directed to the properties of genistein with regards to the protection of normal cells constituting or comprising normal tissues and organisms from the deleterious effects of ionizing radiation, such as the present claimed invention.

The deJuan reference as discussed above, adds nothing to this combination since it is directed solely to the use of genistein for chemoprotection purposes and not for radioprotection

purposes throughout the entire body of a mammal. deJuan is likewise directed to the use of genistein alone to treat the harmful effects of non-ionizing radiation and not a mixture of a flavonoid with a synergist. As a result of the foregoing, combining deJuan with the Brown reference is not proper, and even if it is combined, does not make up for any deficiencies in the base reference or combination with Uckun.

In Applicant's invention as now claimed with multiple active steps, requires a method for radioprotection of a mammal that protects the entire body of a mammal from the harmful effects of ionizing radiation. Claim 31 also specifically requires the isoflavone to be genistein. New claim 32 further requires the isoflavone to be administered to normally functioning cells throughout the entire mammal. New claim 33 requires that the composition or isoflavone consists essentially of one isoflavone and claim 34 specifically states that the isoflavone composition does not include any of the synergists disclosed in the Brown reference. New claims 35 and 36 require the composition to be administered prior to and/or after radiation exposure as opposed to simultaneously as taught by Brown. New claim 38 requires exposure of the entire mammal to a lethal dose of ionizing radiation and new claim 39 requires protection from death by administration of the isoflavone.

For the foregoing reasons, Applicant respectfully submits that the claims as amended define patentable subject matter over all of the references of record. Reconsideration is therefore requested. If the Examiner has any questions regarding this application, he is invited to contact Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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